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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPELLANTS:	Boehler et al.	GROUP ART UNIT: 2173
SERIAL NO.:	10/038,167	EXAMINER: Dennis G. Bonshock
FILED:	October 23, 2001	CONFIRMATION NO.: 7809
TITLE:	"DIAGNOSTIC DEVICE WITH MOUSE-CONTROLLED SWITCHING AMONG DISPLAY CONTROL FUNCTIONS"	

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Commissioner for Patents
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RE-SUBMISSION OF APPEAL BRIEF

S I R:

In a Notification of Non-Compliant Appeal Brief mailed November 29, 2005, the Appeal Brief filed on September 16, 2005 was stated to fail to comply with the provisions of 37 C.F.R. §41.37(c) because it contained a heading "Issues to be Reviewed on Appeal" which the Primary Examiner stated should instead read "Grounds of Rejection to be Reviewed on Appeal." The substitute Appeal Brief submitted herewith makes this editorial correction.

The September 16, 2005 Appeal Brief was also stated to be non-compliant because it did not include an evidence appendix and a related proceeding appendix. These appendices are required only if evidence is being submitted with the Appeal Brief pursuant to any of 37 C.F.R.§ 1.130, 1.131 or 1.132, and a related proceedings appendix is required only if their have been Decisions rendered by a Court or the Board in a related proceeding. There is no requirement to submit such appendices if no such evidence and no related proceedings exist. Including such appendices under those circumstances would be superfluous and meaningless and only add

unnecessary pages to the Appeal Brief. The Primary Examiner has no statutory authority to hold the Brief as being non-compliant for failing to provide such appendices.

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CERTIFICATE OF MAILING

I hereby certify this correspondence is being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on December 6, 2005.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPELLANTS:	Boehler et al.	GROUP ART UNIT: 2173
SERIAL NO.:	10/038,167	EXAMINER: Cuong T Thai
FILED:	October 23, 2001	CONFIRMATION NO.: 7809
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APPELLANTS' MAIN BRIEF ON APPEAL

S I R:

In accordance with the provisions of 37 C.F.R. §41.67, Appellants herewith submit their main brief in support of the appeal of the above-referenced application.

REAL PARTY IN INTEREST:

The real party in interest is Siemens Aktiengesellschaft, assignee of the present application, a German corporation.

RELATED APPEALS AND INTERFERENCES:

There are no related appeals and no related interferences.

STATUS OF CLAIMS:

Claims 1-9 are pending in the application. The original filed with claims 1-8, and claim 9 was added during prosecution. The original Notice of Appeal stated that claims 1-5 and 7-9 were the subject of the present appeal, however, that statement was made in view of the Office Action Summary attached to the final rejection, which stated that claim 6 was objected to. In fact, claim 6 is among the rejected claims, and therefore all claims 1-9 are the subject of the present

appeal. A Substitute Notice of Appeal is being filed herewith, indicating that all claims 1-9 are the subject of the appeal.

STATUS OF AMENDMENTS:

No amendment has been filed following the final rejection. Appellants note that claim 6 was properly objected to due to a word processing error therein. If allowable subject matter is indicated as a result of the present appeal, claim 6 will be appropriately amended following the decision by the Board of Patent Appeals and Interferences.

SUMMARY OF CLAIMED SUBJECT MATTER:

The claims on appeal concern a medical, and mouse-operated diagnostic device having an input device with a detector which detects movement of the mouse in one of a number of predetermined directions and effects a switching or selection, dependent on the detected movement, from one control function to another in order to vary the representation of the images. This is based on the recognition that a movement in a prescribed direction, termed a gesture selection, can effect a changeover in the mode of the mouse. The changeover can then, for example, indicate on the display in a known way which mode is activated by marking a corresponding icon. (p. 2, l. 5-13)

The detector can effect an automatic changeover of the control functions by a brief actuation of the mouse in one of defined directions, the detector being able to detect four defined directions as control functions by gesture selection. (p. 2, l. 21-24)

As an exampled of such a medical diagnostic device, the computed tomography apparatus in Figure 1 has, as a modality for generating three-

dimensional medical images, a measuring unit composed of an X-ray source 2, which is fed by a volume generator 1 and emits a fan-shaped first X-ray beam 3, and a radiation receiver 4 which is composed of a series of individual detectors, for example of 512 individual detectors. The patient 5 to be examined lies on a patient positioning table 6. In order to scan the patient 5, the measuring unit 2, 4 is rotated by 360/ around a measuring field 7 in which the patient 5 lies. (p. 4, l. 12-18)

In this process, the voltage generator 1 is controlled to operate the X-ray source 1 in a pulsed fashion or with continuous radiation. At predetermined angular positions of the measuring unit, sets of data are generated which are fed by the radiation receiver 4 to a computer 8 which uses the generated data records to calculate the attenuation coefficients of predetermined pixels. Connected to the computer 8 is an imaging system 9 which can have a transducer, memory 10 and processing circuits for transforming the data from the computer 8 into image signals. The image system 9 is connected to a monitor 11 for reproducing the images of the radiographed slices of the patient 5. Also, connected to the imaging system 9 is an input device 12 which has a keyboard and a mouse 13. (p. 4, l. 19 –p. 5, l. 4)

The change in the direction of the useful radiation beam 3 is performed by rotating a gantry 15, with the aid of a rotary device (not illustrated), on which the X-ray source 2 and the radiation receiver 4 are mounted. (p. 5, l. 5-7)

By a constructing a number of slices the spiral mode, this computed tomography apparatus can generate 3D volumetric data records which can be further processed by volume rendering in the imaging system 9 for the purpose of better visualization. (p. 5, l. 8-10)

A simple 3D object is illustrated as an example in Figure 2. This object is a hollow cube 16 in which a hollow sphere 17 is located. The two are surrounded by an envelope 18, termed a boundary box. The boundary surface, termed the clip plane 19, specifies the surface on which the observer views the 3D objects. The clip plane 19 has been given this designation due to its effect of cropping parts of the volumetric data record that are of no interest. The three-dimensional manner of viewing is illustrated by rotating the object with respect to the following figures. The empty hemisphere is intended to be seen in the hollow half cube, both being cropped by the clip plane 19. (p. 5, l. 11-18)

In order to then be able to switch in a simple way from the control function causing rotation of the object to other control functions, a detector 14 is provided which detects short movements with the mouse 13 and executes them in accordance with the direction. The clip plane 19 now can be rotated or displaced, or the object 18 itself can be zoomed. This manner of switching applies to skilled operators. (p. 5, l. 19-23) Less skilled operators can right-click the mouse 13 to call up a symbolic context menu 20 which is illustrated in Figure 3 together with the original object. In this case, arrows 21 specify the direction of movement of the gesture selection, while the lettering 22 of the arrows 21 reproduces the selectable control functions. (p. 5, l. 23 – p. 6, l. 3) The current control function "rotate clip plane" and its associated arrow 21 are emphasized in this case. This can be performed by a different color or, as illustrated, by a bold display. The skilled operator can now memorize the control functions and close the menu 20 and carry out the changeover by the short movement with the mouse 13. (p. 6, l. 3-7)

Unskilled operators can briefly right-click the mouse 13 to call up a classic text menu 23 illustrated in Figure 4, in which there are the control commands which are selected in a known way by inputting the underlined letters. (p. 6, l. 8-10)

A further embodiment of the symbolic context menu 20 according to the invention is illustrated in Figure 5, which also has arrows 21 and lettering 22 with the control commands. (p. 6, l. 11-13)

In summary, the mouse 13 is left-clicked in order to be able to rotate the volume illustrated in Figure 2. The mouse is right-clicked in order to be able to rotate the clip plane. The menu illustrated in Figure 3 appears after a prescribed time of, for example, one second. The arrows 21 and the control commands 22 are marked by moving the mouse 13 into the lower right corner. After the mouse button has been released, it is now possible to rotate the clip plane ~~19 by left-clicking~~ the mouse 13 and moving the clip plane 19. (p. 6, l. 14-20)

The fast interactive method can be learned easily by means of the menu according to the invention. Novices can use the normal menu, while the experienced operator can use the menu according to the invention together with visual feedback from arrows 21 and control commands 22. Without hesitation and without a need to divert one's field of view from the display screen, skilled operators can effect switching by the appropriate movement with the mouse in the correct direction. (p. 7, l. 3-8)

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL:

The issues to be reviewed on appeal are:

whether the subject matter of claim 1-4 and 9 would have been obvious to person of ordinary skill in the field of designing user interfaces for medical

diagnostic equipment under the provisions of 35 U.S.C. §103(a), based on the teachings of United States Patent Number 5,954,650 (Saito et al.) in view of United States Patent Number 6,461,298 (Fenster et al.);

whether the subject matter of claim 5 would have been obvious to a person of ordinary skill in the field of designing user interfaces for medical diagnostic equipment under the provisions of 35 U.S.C. §103(a) based on the teachings of (Saito et al.) in view of United States Patent Number 6,725,215 (Yamamoto);

whether the subject matter of claim 6 would have been obvious to a person of ordinary skill in the field of designing user interfaces for medical diagnostic equipment under the provisions of 35 U.S.C. §103(a) based on the teachings of (Saito et al.) in view of United States Patent Number 6,259,382 (Rosenberg); and

whether the subject matter of claims 7 and 8 would have been obvious to a person of ordinary skill in the field of designing user interfaces for medical diagnostic equipment under the provisions of 35 U.S.C. §103(a) based on the teachings of (Saito et al.) in view of United States Patent Number 6,601,055 (Roberts).

ARGUMENT:

Rejection of Claims 1-4 and 9 Under 35 U.S.C. §103(a) Based on Saito et al. in view of Fenster et al.

At pages 2-4 of the final rejection, the Examiner identifies components in the Saito et al. reference corresponding to the basic elements of a conventional medical diagnostic device. Appellants do not have a significant disagreement with the

Examiner's position that the Saito et al. reference provides such teachings. As acknowledged by the Examiner in the middle of page 4 of the final rejection, however, the Saito et al. reference does not disclose an imaging system that influences display of the image on the display unit by a plurality of different control functions respectively uniquely associated with different predetermined movement directions of the mouse, and it does not disclose an input device having a detector that detects a movement of the mouse in one of these predetermined directions to cause the image system to select the control function uniquely associated with that predetermined movement direction, as detected by the detector, to thereby alter the display of the image on the display unit.

The Examiner has relied on the Fenster et al reference as disclosing these limitations in claim 1. Specifically, the Examiner relied on Figures 8a through 8c, and that Figures 9a through 9c of the Fenster et al. reference, and the associated text at column 13, lines 22-31, as allegedly providing such teachings.

Appellants respectfully submit that these portions of the Fenster et al. reference merely teach altering the display *in response to* directional, mouse-controlled movement of a cursor, but do not provide a teaching to detect and implement different control functions dependant on the detected direction or movement. As explained below, in the Fenster et al. reference, one and only one control function is implemented in conjunction with the aforementioned directional, mouse-controlled movement of the cursor. The direction of movement of the cursor, and the extent of that movement, produce different *results* on the displayed image, but those results are always the outcome of the same control function being implemented. The results change because the *input* changes due to the changing

direction and degree of movement of the cursor, but it is always the same control function in the Fenster et al. reference that is being implemented on such a changing input.

By contrast, claim 1 explicitly requires that the imaging system be able to execute a plurality of *different* control functions and each of those different control functions is uniquely associated with a predetermined movement direction of the mouse, which is detected. In other words, a detected movement of the mouse in one direction causes a first of the control functions to be implemented (this first of the control functions being uniquely associated with the detected movement direction), and when the mouse is then moved in a different direction, a second (different) one of the control functions is then implemented (this second of the control functions being uniquely associated with the different movement direction).

The different views of the displayed object shown in the Fenster et al. reference in Figures 8a through 8c and Figures 9a through 9c occur as a result of the controlled movement of the cursor on the display screen described in the passage noted by the Examiner at column 13, lines 22-31 in the Fenster et al. reference. As explained in that passage, the displayed image undergoes a rotation around a vertical axis as the graphical input device 38 is moved to drag the cursor across the main display window from mid-right to mid-left. This rotation is shown in Figures 8a through 8c. When the graphical input device 30 is moved to drag the cursor across the main display window from top-left to bottom-right, the rotation of the items around an axis at an angle of approximately 30° to the horizontal and sloping upwardly and to the right, occurs, as shown in Figures 9a through 9c. This is

stated to give the operator the sense of "taking hold" of the displayed image and pulling it around.

Therefore, although such movement of the cursor is undeniably detected in the Fenster et al. reference and causes an alteration of the way the displayed item is presented on the display screen, there is nevertheless one and only one control function that is implemented to achieve these different views. This is made clear in each of Figures 7A and 7B of the Fenster et al. reference. As stated at column 3, lines 3-5 of the Fenster et al. reference, Figures 7A and 7B are among flow charts that show steps performed by the user interface and the display modules when manipulating the displayed three-dimentional image. As can be seen in Figure 7A, detection of the mouse movement occurs in step 332 (mouse moving?). There are only two possible outcomes from step 332. If no mouse movement is detected, nothing happens and the flow chart loops back to step 324. If mouse movement is detected, then the one and only possibility is to proceed to step 334, wherein the movement is calculated and tracked with the cursor on the screen. There is thus one and only one control function that is implemented dependent on the mouse movement, namely step 334 which is "calculate movement and track movement with cursor on screen." As noted above, it is of course true that as the direction of movement is changed, and as the extent of the movement increases, the result of the calculation that is ongoing will cause the presentation on the display to change. This is not the result of a different control function being implemented, however, but is merely the result of different *inputs* to the *same* control function, namely step 334.

It is of course possible in the Fenster et al. reference to change the control functions, however, this *not* done by detecting a direction of cursor (mouse)

movement and then implementing a control function that is uniquely associated with that movement direction, as set forth in claim 1 of the present application. Instead, selection or changing of a control function is implemented in the Fenster et al. reference along a path that proceeds in parallel to the path in the flowchart of Figure 7A that includes step 334. In step 336 in Figure 7A, it is first detected whether the cursor is in the main display window, and if the outcome of this inquiry is "no", the flowchart proceeds to step 338, to determine whether the cursor is over an option icon. If the outcome of step 338 is "yes", then the option icon routine is invoked. As can also be seen from Figure 7A, it is impossible for the outcome of step 334, wherein movement direction is detected, to have any influence whatsoever on step 338, which is the step wherein a different control function can be implemented.

This is also consistent with the further portion of the flow chart shown in Figure 7B which proceeds from the "no" output of step 340 in Figure 7A. Again in Figure 7B, in step 342, cursor movement is tracked, however, the one and only control function that can be implemented is the same as in Figure 7A, namely to calculate rotation of the displayed item and to rotate the image of the item, in step 344. Again, the appearance of the displayed image can change, but this is not due to implementing a different control function, but is due to changing *inputs* supplied to a single control function that is always implemented.

Appellants respectively submit the Examiner has confused altering a displayed item as a result of different directional movement *inputs* supplied to the *same* control function (Fenster et al), with altering a display presentation by detecting different mouse movement directions and causing a *different control function* to be implemented for each of the different directions (claim 1 on appeal).

The fact that the Fenster et al. reference does not, and cannot, implement different control function dependent on different directions of movement of the cursor (mouse), is made clear by the aforementioned statement in the Fenster et al. reference in the passage cited by the Examiner at column 13, lines 30-31. As noted above, the movement/display coordination or relationship is intended to give the user the sense of taking hold of the displayed image and pulling it around. If different control functions were implemented depending on whether different movement directions of the cursor were detected, this would preclude the operator from having such a sense of taking hold of the displayed image and pulling it around. The intuitive relationship between the cursor movement and the resulting re-orientation of the displayed object would be completely lost. Therefore, it is essential to the intended operation of the Fenster et al. reference, that, as explained above, one and only one control function be implemented, even though the computational outcome of this control function obviously changes as the inputs change.

Therefore, not only would the subject matter of claim 1 would not result if the Saito et al. system were modified in accordance with the teachings of Fenster et al., but also the Fenster et al. reference provides teachings which would *preclude* the manner of operation described in claim 1. Therefore, there is motivation whatsoever in either of those references to combine those references in a manner that would allegedly result in a system operating as set forth in claim 1. Claim 1, therefore, would not have been obvious to person of ordinary skill in the field of designing user interfaces for medical diagnostic systems under the provisions of 35 U.S.C. §103(a), based on the teachings of Saito et al. and Fenster et al.

Claims 2-4 and 9 add further structure to the non-obvious combination of claim 1 and therefore would not have been obvious to a person of ordinary skill in the field of designing user interfaces for medical diagnostic devices for the same reasons discussed above in connection with claim 1.

Rejection of Claim 5 Under 35 U.S.C. §103(a) as being based solely on Saito et al. in view of Yamamoto

As an initial observation, since claim 5 depends from claim 1, and since the Examiner has acknowledged that the Saito et al. reference does not disclose the aforementioned selection of control functions by detecting mouse movement, it is not clear how the Examiner believes claim 5 would have been obvious under 35 U.S.C. §103(a) based solely on Saito et al. in view of Yamamoto. If this is truly the Examiner's intended rejection, the Examiner's own statements regarding the teachings and content of the Saito et al. reference in connection with claim 1 are dispositive to overcome this rejection.

If the failure to include the Fenster et al. reference in the rejection of claim 5 was an oversight, and the rejection should actually be based on a combination of the teachings of Saito et al. and Fenster et al. further in view of Yamamoto, then the same arguments above with regard to the Saito et al./Fenster et al. combination apply. Even if the Examiner is correct with regard to the stated teachings of the Yamamoto reference, modifying the Saito et al./Fenster et al. combination in accordance with those teachings from Yamamoto still would not result in the subject matter of claim 5, which embodies the subject matter of claim 1 therein.

Claim 5, therefore, would not have been obvious to a person of ordinary skill in the field of designing user interfaces for medical diagnostic systems under the

provisions of 35 U.S.C. §103(a) based on a combination of the teachings of Saito et al. and Yamamoto, with or without the teachings of Fenster et al.

<u>Rejection of Claim 6 Under 35 U.S.C. §103(a) Based on Saito et al. and Rosenberg</u>

Similar arguments apply to claim 6 as are discussed above in connection with claim 5. Since claim 6 embodies the subject matter of claim 1 therein, it is not seen how the teachings of Saito et al. and Rosenberg could constitute a basis for rendering claim 6 obvious under 35 U.S.C. §103(a) in view of the Examiner's own statements regarding the teachings that are missing in the Saito et al. reference.

Claim 6, therefore, would not have been obvious to a person of ordinary skill in the field of designing user interfaces for medical diagnostic systems under the provisions of 35 U.S.C. §103(a) based on the teachings of Saito et al. and Rosenberg, with or without the teachings of Fenster et al.

<u>Rejection of Claims 7 and 8 Under 35 U.S.C. §103(a) Based on Saito et al. and Roberts</u>

The same considerations apply to 7 and 8 as are discussed above in connection with claims 5 and 6. Since claims 7 and 8 embody the subject matter of claim 1 therein, the combination of the teachings of Saito et al. and Roberts does not result in a system comparable to the subject matter of claims 7 and 8, in view of the Examiner's own statements regarding the teachings that are absent in the Saito et al. reference. Claims 7 and 8, therefore, would not have been obvious to a person of ordinary skill in the field of designing user interfaces for medical diagnostic systems based on the teachings of Saito et al. and Roberts, with or without the teachings of Fenster et al.

CONCLUSION:

For the above reasons, Appellants respectfully submit the Examiner is in error in law and in fact in rejecting claims 1-9 based on the teachings of above-discussed references. Reversal of those rejections is therefore proper, and the same is respectfully requested

This brief is accompanied by a check in the amount of $500.00, as required by 37 C.F.R. §1.17(f).

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CERTIFICATE OF MAILING

I hereby certify that an original and two copies of this correspondence are being deposited with the United States Postal Service as First Class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450 on December 6, 2005.

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APPENDIX "A"

1. A diagnostic device comprising:

an arrangement for generating raw data representing an object;

a computer supplied with said raw data for calculating image data from said raw data;

an imaging system connected to said computer and supplied with said image data for generating input signals from said image data;

an input device connected to said imaging system, and having a user-operable mouse;

a display unit connected to said imaging system and supplied with said image data for displaying an image containing said object dependent on said image data; and

said imaging system allowing influencing of the display of said image on said display unit by a plurality of different control functions respectively uniquely associated with different predetermined movement directions of said mouse, said input device having a detector which detects a movement of said mouse in one of a said plurality of predetermined directions and said imaging system selecting the control function uniquely associated with said one of said plurality of said predetermined directions detected by said detector, to alter the display of said image on said display unit.

2. A diagnostic device as claimed in claim 1 wherein said arrangement for generating raw data comprises an arrangement for generating raw data representing a volume of said object, and wherein said computer comprises a computer for calculating image data representing a three-dimensional image from said raw data, wherein said imaging system comprises an imaging system for generating image signals from said image data representing a three-dimensional image of said volume, and wherein said display unit displays said three-dimensional image, and wherein said detector alters the display of said three-dimensional image on said display unit dependent on said movement of said mouse in one of said plurality of predetermined directions.

3. A diagnostic device as claimed in claim 2 wherein said control functions are selected from the group consisting of rotating said object in said three-dimensional image, zooming of said object in said three-dimensional image, rotating a clip plane in said three-dimensional image, and displacing a clip plane in said three-dimensional image.

4. A diagnostic device as claimed in claim 1 wherein said detector automatically switches from one of said control functions to another of said control functions upon a brief actuation of said mouse in said one of said plurality of predetermined directions.

5. A diagnostic device as claimed in claim 1 wherein said detector comprises a detector for detecting four defined directions, respectively corresponding to different control functions, by gesture selection.

6. A diagnostic device as claimed in claim 1 wherein said plurality of predetermined directions are respectively oriented at angles of 45□ relative to a Cartesian coordinate system.

7. A diagnostic device as claimed in claim 1 wherein, upon right-clicking of said mouse, said imaging system causes a text menu to be displayed on said display which symbolizes said plurality of predetermined directions and includes associated text explanations, and wherein said imaging system, controlled by gesture selection using said mouse, automatically changes from one of said control functions to another of said control functions.

8. A diagnostic device as claimed in claim 1 wherein said imaging system, upon briefly right-clicking of said mouse, displays a text menu identifying said plurality of control functions on said display.

9. A diagnostic device as claimed in claim 1 wherein said imaging system selects said one of said control functions exclusively dependent on said one of said predetermined directions detected by said detector.

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